ATTACHMENT 15

REDUCED DELTA WATER DEPENDENCE

<filename Att15_IG1_MWA_DeltaWater_1ofTotal1 >

The Mojave Water Agency (MWA) IRWM Region receives State Water Project water delivered from the Sacramento-San Joaquin Delta. Actions that MWA takes within the IRWM Region contribute to the success of the Bay-Delta Program objectives.

The vast groundwater resources underlying the Region have been overdrafted since the 1950s. MWA was formed in 1959 and activated in 1960 to manage declining groundwater levels. The Morongo Valley and Johnson Valley were annexed in 1965, and the Agency now covers over 4,900 square miles, about three percent of the state. The Mojave Basin Area and Warren groundwater basins have been adjudicated and physical solutions developed to correct overdraft. A SWP supply was acquired and facilities were built for its import. The Mojave Groundwater Basin is located along the California Aqueduct and has nearly two million acre-feet of available storage.

MWA prepared its first Regional Water Management Plan in 1994[1]. Subsequent additions to California law promote development of integrated water resource management plans and groundwater management plans. The 2004 MWA Regional Water Management Plan Update serves as an Integrated Regional Water Management Plan, Groundwater Management Plan, and Urban Water Management Plan. The 2004 Plan is included as Attachment A (Att1_IG1_MWA_ Eligible _2ofTotal2) to this application.

This IRWM Plan was prepared with input from a Technical Advisory Committee (TAC) convened as an advisory panel. Fundamental objectives established with the input of the TAC are to: 1) balance future water demands with available supplies, and 2) maximize the overall beneficial use of water throughout MWA. To compare expected performance of alternative combinations of projects and management alternatives, a screening model was developed. The screening model simulates the changes to groundwater hydrology, Mojave River flows, and pumping and return flows that would result from implementation of the identified projects and management actions. Each alternative was evaluated and ranked according to its effectiveness in meeting the long-term needs of the groundwater basins. The preferred alternative included aggressive water conservation programs, and even

[1] Bookman-Edmonston Engineering, Inc., June 1994. "Mojave Water Agency Regional Water Management Plan"

more aggressive conservation targets were established. The Plan analysis concluded that in order to balance the groundwater basins by 2020, MWA would be necessary for MWA to utilize its full SWP supply.

Objectives

The statement of Fundamental Objectives developed with the TAC can be found at page 9-2 of the Plan and are presented below.

> "The objectives established for the Mojave Water Agency Regional Water Management Plan (MWA RWMP) through 2020 are to:
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> Balance future water demands with available supplies recognizing the need to:
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> - **stabilize the groundwater basin storage balance over long-term hydrologic cycles**
> - protect and restore riparian habitat areas as identified in Exhibit H of the Mojave Basin Area Judgment and the Department of Fish & Game management plan required by Exhibit H
> - limit the potential for well dewatering, land subsidence, and migration of poor quality water
> - **maintain a sustainable water supply through extended drought periods**, and
> - select projects with the highest likelihood of being implemented.
>
> Maximize the overall beneficial use of water throughout MWA by:
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> - supplying water in quantity and of quality suitable to the various beneficial uses
> - addressing at a minimum Table 7-1 issues throughout the MWA service area recognizing the interconnection and interaction between different areas
> - distributing benefits that can be provided by MWA in an equitable and fair manner
> - ensuring that costs incurred to meet beneficial uses provide the greatest potential return to beneficiaries of the project(s)
> - avoiding redirected impacts, and
> - identifying sustainable funding sources including consideration of affordability.
>
> **"Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater. With groundwater storage stabilized, there will be groundwater available during surface water supply shortages and delivery interruptions**. With a balanced basin, groundwater elevations will be relatively stable and be kept above historic lows. This will reduce the potential for land subsidence and associated aquifer compaction. By limiting migration of poor quality water, available supplies will be of sufficient quality to meet drinking water objectives, thereby increasing long-term water supply reliability." (emphasis added)

Nearly all water used within the Plan area is pumped from groundwater storage. The intent of the Plan is to utilize imported SWP water to recharge the groundwater aquifer to stabilize the basin and provide a reserve that can be utilized during drought and delivery interruptions. The planning was performed based on expected long-term average SWP deliveries (then 77 percent of Table A). Utilizing the storage reserves within MWA in response to drought or outage reduces dependence on the Bay-Delta system.

Water Supply and Demand

The Region-wide water balance under year 2020 conditions is presented at page 5-36 of the Plan. Table 5-12 from the Plan is presented below. "Agricultural Demand Scenario 2" assumed that water markets created as

part of the adjudication of the Mojave Basin Area would lead to a reduction in agricultural water use, a condition that is now reality. SWP supplies are projected to provide nearly half of the Region's water needs.

Table 5-12
Year 2020 Average Annual Water Balance under Agriculture Scenario 2
(Acre-feet/year)

	Net Average Annual Water Supply[1]	Water Use			Surplus/ Deficit
		Agricultural	Urban[2]	Total	
Mojave Basin Area					
Alto	34,700	1,300	78,100	79,400	-44,700
Baja	5,600	600	11,100	11,700	-6,100
Centro	18,500	8,900	12,300	21,200	-2,700
Este	3,500	1,400	2,600	4,000	-500
Oeste	1,100	300	3,500	3,800	-2,700
Subtotal Mojave	63,400	12,500	107,600	120,100	-56,700
MB/JV Area					
Copper Mtn. Valley	600	0	1,000	1,000	-400
Johnson Valley	2,300	0	50	50	+2,250
Means/Ames Valley	600	0	600	600	0
Warren Valley	900	0	2,100	2,100	-1,200
Subtotal MB/JV[3]	2,100	0	4,000	4,000	-1,900
Total	**65,500**	**12,500**	**111,600**	**124,100**	**-58,600**
			Average Annual SWP Supply:		**58,400**
			Surplus/Deficit with SWP Supply:		**-200**

[1]Net average annual water supply data as shown in Tables 4-2 and 4-5 of Chapter 4.
[2]Urban uses include municipal, industrial, golf course, and recreational water uses.
[3]Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

The Table 5-12 analysis showed that all of MWA's available State Water Project supplies would be needed by 2020. Available supplies were based on the 2002 State Water Project Reliability Study which estimates an average 77 percent reliability. MWA's Table A amount was 75,800 acre-feet per year, of which (0.77 x 75,800 =) 58,400 acre-feet per year was expected to be available on average. Full (75,800 acre-foot) deliveries are relied upon in wet years to replenish the basin and provide a drought reserve to be used during conditions of drought or outage.

Subsequent demand and conservation projections for Urban Water Management Plan preparation, and downward revision of SWP reliability by DWR indicated the need additional supplies after 2020, which led to MWA's acquisition of an additional 14,000 acre-feet of Table A in 2009.

Management Actions

Chapter 10 of the 2004 Plan describes Management Actions to be implemented under the Plan. The Management Actions consist of 60 specific actions that can be grouped into the following seven elements:

1. Monitoring
2. Improve characterization of the basin
3. Continue long-term planning
4. Groundwater protection
5. Construction and implementation
6. Financing
7. Public participation

The Long-Term Planning Actions include (at page 10-16):

> **"Identify Post 2020 Water Supply**
>
> MWA has a State Water Project water contract for up to 75,800 acre-feet per year. The water supply-demand analysis performed as part of this Plan (Chapter 5) indicates that, assuming municipal conservation of 10 percent, the full **available** SWP supply will be needed by 2020. Preliminary estimates of future water demand, assuming current trends continue, indicate that an additional 60,000 to 100,000 acre-feet per year will be needed by 2050. MWA has initiated efforts to determine sources where this additional supply might be obtained. Potential options include pre-banking of existing supplies, new appropriations, water banking or exchange arrangements, water transfers, developing water conservation or desalination credits, and aggressive management of existing supplies, including exploring higher levels of conservation. **MWA has recently negotiated a short-term groundwater banking arrangement with the Metropolitan Water District, and discussions for a larger, long-term banking project are underway**. The feasibility of the post-2020 options has yet to be examined.
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> **Action:** MWA will continue to research options for meeting post-2020 water needs, categorize and prioritize the options, and examine and implement the higher-priority options." (emphasis added)

This Action led to the identification of 14,000 acre-foot Table A transfer, and documents water banking as a strategy to develop long-term reliability from Bay-Delta water supplies that were becoming less reliable. The pilot banking study with Metropolitan Water District successfully recharged and recovered Metropolitan SWP water in MWA aquifers, but a long-term agreement was not reached.

Actions at page 10-17 include:

> **"State Water Project**
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> MWA has an annual State Water Project entitlement of 75,800 acre-feet per year. According to the Final State Water Project Reliability Report (DWR 2002), MWA should expect to receive an average of about 58,400 acre-feet per year each year if they request their full entitlement. As indicated in Chapter 5, MWA will need to utilize their entire SWP entitlement in order to bring the groundwater basin into balance in 2020.
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> **Action:** MWA will stay actively involved in State Water Project planning processes that are conducted by the Department of Water Resources and other water planning agencies. The expected reliability of State Water Project could be affected by changes in system operation or by modifications in planning models that are used to project SWP deliveries. MWA will advocate for operations that enhance its supply, track changes in SWP reliability, and adjust its plans accordingly."

This Action demonstrates the commitment to build the MWA supply around SWP reliability, planning operations that maximize wet year water banking to provide a stored water reserve for use in times of drought or outage, but never basing future operations on more than average Bay-Delta reliability.

Under Construction and Implementation (page 10-21), MWA puts the highest priority on implementing conservation programs:

> "**Construction and Implementation**
>
> …Municipal conservation is considered to have the highest priority because measures will need to be initiated immediately in order to achieve 10 percent conservation by 2020."

Because of subsequent more aggressive planning for 20 percent reduction in per capita use, the 10 percent goal had been largely met by 2010. The commitment to conservation results in reduced reliance on imported supplies.

Actions Since IRWMP Adoption

Since the adoption of the 2004 IRWMP for the Regions, MWA has furthered conjunctive use through development of policies and programs that buffer the uncertainty of supplies and thus reduce reliance on Bay-Delta exports. These policies and programs include:

- MWA storage accounts established under the terms of the Mojave Basin Area Judgment. The MWA utilizes these storage accounts to store SWP water when available and to meet the requirements of the Judgment when SWP water is not available to meet those demands.
- MWA storage agreement with the Hi-Desert Water District to build a storage reserve in the Warren Basin.
- Storage serving multiple entities, including MWA, San Bernardino County, Bighorn-Desert View Water Agency and Hi-Desert Water District, through the to-be-constructed Ames Basin Project and associated agreements.
- Ordinance 9, which requires entities desiring to purchase SWP water from MWA to acknowledge that SWP water is annual (no rights to SWP water granted) and interruptible (may not be delivered due to hydrology or limitations on the SWP, including regulatory restrictions in the Delta). The applicants are consequently required to maintain an alternative supply in the event MWA cannot deliver SWP water. This has been put into practice for both the High Desert Power Project and the LUZ Solar facility through SWP water stored in local ground water basins for their use during outages or reduced allocations.
- Development and Implementation of the Pre-Purchase and Claim Programs that enable and encourage retail purveyors to participate in the purchase and storage of SWP water for their use during periods when SWP allocations are reduced.
- Design and implementation of the Regional Recharge and Recovery (R-cubed) Project that will add substantial capacity to percolate and store large volumes of SWP water , when available, into the Mojave River floodplain aquifer.

Future Planning

The Region has a contract for State Water Project supplies from the Delta which is used to meet a portion of local demand and has developed methods for reducing reliance on exports from the Bay-Delta during droughts or outages; therefore the Region is eligible for augmented funding in this grant process.

The Mojave Water Agency RWMG has committed to full utilization and development of supplies within the Region's source area through conservation, conjunctive use, groundwater banking, flexible timing of delivery and recharge systems, and environmental protection. The Plan recognizes decreased reliability of water exported from the San Joaquin-Sacramento River Delta (Delta) system. Revision to the MWA IRWM Plan (as required by

DWR pursuant to a grant agreement for funding awarded during this solicitation) will continue development of measures to help reduce reliance on the Sacramento-San Joaquin Delta for water supply.

The MWA IRWM Plan recognizes that the vast storage capabilities underlying the Region allows for and provides increased flexibility in the timing of SWP deliveries, therefore decreasing the competition for pumping Delta water south of the Delta at critical times.